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Indian Standard

SPECIFICATION FOR
INK, FINGER PRINTING, BLACK

(*First Revision*)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Indian Standard

SPECIFICATION FOR INK, FINGER PRINTING, BLACK

(*First Revision*)

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Indian Standard

SPECIFICATION FOR INK, FINGER PRINTING, BLACK (*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 31 January 1980, after the draft finalized by the Inks and Allied Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was originally published in 1959. The Sectional Committee responsible for its preparation decided to revise it in the light of experience gained since its publication. In this revision, the requirement for consistency and its method of evaluation has been added.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for black finger printing ink used for taking impressions of fingers, thumbs and palms for the purpose of identification of persons.

2. REQUIREMENTS

2.1 Description — The material shall consist of a dispersion of carbon black (see IS: 40-1971 †) with or without admixture of other pigments in a suitable oil base. The colour of the finished material shall be jet black.

2.1.1 The material shall be of uniform consistency, free from grit and other substances likely to act as irritants to human skin. Oils used as vehicle shall preferably be free from odour and in any case shall not have any obnoxious smell.

*Rules for rounding off numerical values (revised).

†Specification for carbon black (first revision).

2.2 Pigment Content — The material when tested by the method given in 27 of IS : 101-1964* shall contain not less than 7.0 percent by mass of pigments.

2.3 Consistency — The consistency of the ink shall be like a soft paste and it shall have just sufficient tack to enable it to be rolled uniformly on a glass plate with a rubber roller when tested as prescribed in Appendix A. At the same time when the ink is spread on art paper with a rubber roller it shall not pick up any part of the paper surface while spreading on it.

2.4 Applicability — The material when tested by the method prescribed in Appendix B, shall not be inferior to the approved sample.

2.5 Fastness and Smudginess — The prints made by the material when tested by the method prescribed in Appendix C, shall be fast to saline water, dilute acetic acid, organic solvents and ultraviolet light and shall not be affected by rubbing with a finger.

2.6 Relative Density — The relative density of the material at 27°C when tested by the method prescribed in Appendix D shall be 0.980 to 0.995.

3. KEEPING QUALITY

3.1 The material when stored under normal conditions in original sealed containers shall retain the properties detailed in this specification for a minimum period of 2 years from the date of manufacture.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed in securely closed collapsible tubes (see IS : 3101-1965†).

4.2 Marking — The containers shall be marked with the following information:

- a) Name of the material;
- b) Manufacturer's name or his recognized trade-mark, if any;
- c) Mass of the material in the container;
- d) Month and year of packing; and
- e) Identification mark in code or otherwise to enable the lot of manufacture to be traced from records.

*Methods of test for ready mixed paints and enamels (second revision).

†Specification for collapsible tubes.

4.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 The method of drawing representative samples of the material from a lot, number of samples to be tested and the criteria for conformity of the material to the requirements of this specification shall be as prescribed in Appendix E.

APPENDIX A

(Clause 2.3)

TEST FOR SUITABILITY OF INK CONSISTENCY

A-1. APPARATUS

A-1.1 Glass Plate — A sheet of glass plate of size 45×45 cm and 15 mm thickness.

A-1.2 Rubber Roller — Made of neoprene rubber sheet, about 2.5 mm in thickness, mounted tightly on a wooden roller. The roller shall be pivoted to a mild steel bracket shaped like a channel about $11 \times 4 \times 1.2$ cm (outside dimension) and made of 1.5 mm sheet. The roller with the bracket shall be provided with a wooden handle about 12 cm long fitted with brass ferrule 8 mm wide. The roller shall roll freely.

A-1.3 Art Paper Sheet — Size, 11×11 cm (see IS : 4658-1968*).

A-2. PROCEDURE

A-2.1 Clean the glass plate. Place the 11×11 cm art paper sheet on the glass plate and take about 1 g of ink on the paper. Spread the ink uniformly on the art paper by rubber roller. After proper spreading of ink, watch whether the roller is picking up any portion of art paper. If there is no lifting of paper, the ink shall be considered satisfactory.

*Specification for coated paper and board (art and chromo).

APPENDIX B

(Clause 2.4)

TEST FOR APPLICABILITY

B-1. APPARATUS

B-1.1 Glass Plate — Same as in A-1.1.

B-1.2 Rubber Roller — Same as in A-1.2.

B-2. PROCEDURE

B-2.1 Clean glass plate. Mark on area of 11×11 cm on the plate with a glass marking pencil. Put about 0.5 g of ink within the marked area and spread it uniformly with rubber roller to cover the marked area.

B-2.2 When the inked plate is ready, roll the thumb from nail on the plate in one direction and only once at one place. Then roll the thumb on to a glazed card in exactly the same manner as was done on the inked plate.

B-2.3 Clean the thumb, and produce another thumb impression using exactly the same procedure with an approved sample of the ink.

B-2.4 The impression shall be not inferior with regard to intensity and clean reproduction of the ridge of the thumb than the impression produced by the approved sample of the ink when viewed through a magnifying glass.

APPENDIX C

(Clause 2.5)

TEST FOR FASTNESS AND SMUDGINESS

C-1. TEST SPECIMENS

C-1.1 Take a few strips (about 10×5 cm) of cream wove/cream laid paper of 60 g/m^2 (see IS : 1848-1971*) and make a couple of thumb impressions (as prescribed in B-2.1 and B-2.2) on each strip. The impression shall be clear and of equal intensity.

C-1.2 Smudginess — After 3 minutes of marking the thumb impressions, lightly rub the impressions with a finger. The impressions shall have no tendency to smudge.

C-1.3 Fastness to Saline Water — Take a strip with thumb impressions and keep in a solution of sodium chloride (approximately 10 percent m/v)

*Specification for writing and printing papers (first revision).

for one hour at room temperature. The ink shall be considered fast to saline water if impressions remain clear without any noticeable spreading of ink or loss of intensity.

C-1.4 Fastness to Organic Solvents — Take two fresh strips having thumb impressions and keep one in denatured spirit (*see* IS : 324-1959 *) and the other in petroleum ether (*see* IS : 1745-1966†) for one hour. The ink shall be considered fast to organic solvents if the impressions remain clear without any noticeable spreading of ink or loss of intensity.

C-1.5 Fastness to Dilute Acetic Acid — Take another strip having thumb impressions and keep for one hour in dilute acetic acid (5 percent *m/m*), at room temperature. The ink shall be considered fast to dilute acetic acid if impressions remain clear without any noticeable spreading of ink or loss of intensity.

C-1.6 Ultra-violet Ray Exposure — Place a strip having thumb impressions at a distance of 25 cm from an ultra-violet lamp normal to the rays and expose for 36 hours. The ink shall be considered fast to ultra-violet rays if there is no appreciable loss in intensity of thumb impressions.

C-1.6.1 The ultra-violet lamp shall be of 125 watts and of long wave UV region, chiefly at 365.5 m/ μ m.

APPENDIX D

(Clause 2.6)

DETERMINATION OF RELATIVE DENSITY

D-1. DEFINITION

D-1.1 For the purpose of this standard, the relative density of the material is the ratio of the mass of a given volume of the material to that of an equal volume of distilled water, the temperature of both the material and the water being 27°C.

D-2. APPARATUS

D-2.1 Hubbard Relative Density Bottle (Modified) — *See* Type 6 of IS : 5717-1970‡.

D-3. PROCEDURE

D-3.1 Clean, dry and weigh the bottle and the stopper. Fill with water at a temperature of about 25°C, introduce the stopper and keep in a water

*Specification for ordinary denatured spirit (*revised*).

†Specification for petroleum hydrocarbon solvents (*second revision*).

‡Specification for pycnometers.

bath at 27°C for 15 minutes. Wipe off all surplus water from the surface with a soft, clean and dry cloth and weigh again. Empty the bottle, clean and dry and repeat the operations after filling it with the material.

D-4. CALCULATION

D-4.1 Relative density at 27°C = $\frac{M_2 - M}{M_1 - M}$

where

M_2 = mass in g of the relative density bottle filled with the material,

M = mass in g of the dry relative density bottle, and

M_1 = mass in g of the relative density bottle filled with distilled water.

APPENDIX E

(Clause 5.1)

SAMPLING OF FINGER PRINTING, INK, BLACK

E-1. GENERAL REQUIREMENTS OF SAMPLING

E-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

E-1.1 Samples shall be drawn from originally unopened tubes.

E-1.2 Samples shall not be taken in an exposed place.

E-1.3 The sampling apparatus shall be clean and dry when used.

E-1.4 Precautions shall be taken to protect the samples, i.e. material being sampled, the sampling apparatus and the containers for samples from adventitious contamination.

E-1.5 The samples shall be kept in clean, dry, airtight glass or other suitable containers on which the material has no action.

E-1.6 The sample containers shall be of such a size that they are almost completely filled by the sample.

E-1.7 Each sample container shall be sealed airtight with a stopper after filling, and marked with full details of sampling, the date of sampling and the month and year of manufacture of the material.

E-1.8 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

E-2. SCALE OF SAMPLING

E-2.1 All the tubes in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture, the tubes belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

E-2.1.1 Samples shall be tested from each lot separately for ascertaining the conformity of the material to the requirements of the specification.

E-2.2 The number of tubes to be chosen from the lot shall depend on the size of the lot and shall be in accordance with Table 1.

TABLE 1 NUMBER OF TUBES TO BE SELECTED FOR SAMPLING

LOT SIZE	NO. OF TUBES TO BE CHOSEN
(N)	(n)
(1)	(2)
2 to 15	2
16 to 40	3
41 to 65	4
66 to 110	7
Above 110	10

E-2.3 These tubes shall be chosen at random from the lot and in order to ensure the randomness of selection, a random number table shall be used. For guidance and use of random number table, IS : 4905-1968* may be referred. In the absence of random number table, the following procedure may be adopted:

Starting from any tube in the lot, count them as 1, 2, 3, etc. up to r and so on. Every r th tube thus counted shall be withdrawn from the lot to give a sample for test, where r is the integral part of N/n , N being the total number of tubes in the lot and n the number of tubes to be chosen.

E-3. TEST SAMPLES AND REFEREE SAMPLE

E-3.1 Preparation of Test Samples

E-3.1.1 Squeeze out a small portion of the material from each tube selected (see Table 1). Thoroughly mix the material drawn from the same tube. Out of these portions, a small but equal quantity shall be taken for each selected tube and shall be well mixed up together so as to form a

*Methods for random sampling.

composite sample of quantity sufficient to make triplicate determinations for all the characteristics to be tested on the composite sample. This composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third for the referee.

E-3.1.2 The remaining portions of the material from each tube (after a small quantity needed for formation of the composite sample has been taken out) shall be divided into three equal parts. These parts shall be immediately transferred to thoroughly dried bottles which are then sealed airtight with stoppers and labelled with all the particulars of sampling given under **E-1.7**. The material in each such sealed bottle shall constitute a test sample. These individual samples shall be separated into three identical sets of test samples in such a way that each set has a test sample representing each tube selected (*see* Table 1). One of these three sets shall be marked for the purchaser, another for the supplier and the third for the referee.

E-3.2 Referee Sample

E-3.2.1 Referee sample shall consist of the composite sample (*see* **E-3.1.1**) and a set of test samples (*see* **E-3.1.2**) marked for the purpose and shall bear the seals of the purchaser and the supplier. This shall be kept at a place agreed to between the purchaser and the supplier and shall be used in case of a dispute between the two.

E-4. NUMBER OF TESTS

E-4.1 Tests for applicability and fastness of the material shall be conducted on each of the samples constituting a set of test samples.

E-4.2 Tests for the determination of other characteristics mentioned in 2 shall be conducted on the composite sample.

E-5. CRITERIA FOR CONFORMITY

E-5.1 A lot shall be declared as conforming to the specification if it satisfies the requirements for each of the characteristics mentioned in this specification.

E-5.2 If the requirements for any of the characteristics are not met, the lot shall be declared to have not satisfied the requirements of the specification and shall be rejected.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Conversion
Force	newton	N	1 N = 1 kg. 1 m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 01 31

Telegrams : Manaksanstha

Regional Offices:

		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	23-08 02
Southern : C. I. T. Campus, Adyar	MADRAS 600020	41 24 42

Branch Offices:

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